PLEASE AMEND THE SPECIFICATION AS FOLLOWS:

PORTABLE PLAYER FOR PERSONAL VIDEO RECORDERS

TECHNICAL FIELD OF THE INVENTION

The present invention relates to ~~a~~ portable video display devices, and particularly to low-cost, portable video display devices which reproduce compressed digital video data for display. The invention further relates to a portable video display device for reproducing compressed video data recorded by a personal video recorder.

BACKGROUND OF THE INVENTION

Personal video recorders (PRVs) such as provided by Tivo™ and Replay™, are a relatively recent development compared with the older tape-based video cassette recorders. PVRs record broadcast video data in a proprietary, compressed video format based ~~on~~ upon a standard encoded, audio-visual, digital, compressed format, e.g., ~~such as~~ MPEG-2, and provide a convenient way to time-shift a broadcast video program. Unfortunately, conventional PVRs are not portable, and thus do not provide a convenient way to "place-shift." (permit recording and viewing recorded broadcast video programs in alternate locations).

Accordingly, a first object of the present invention is to provide a ~~low-cost~~low-cost portable playback device for reproducing compressed digital information at a time and a place different from the time and place of the original video reception.

A further object of the present invention is to provide a portable playback device configured to reproduce compressed video information recorded by a PVR for viewing.

These and other objects of the present invention are discussed or will be apparent from the detailed description of the invention.

SUMMARY OF THE INVENTION

A low-cost, portable digital video player is provided which includes a rewritable, ~~nonvolatile~~non-volatile memory (such as a hard disk), a media decoder, a user input device~~,~~ and a display. The player receives the pre-recorded video information~~,~~ (previously recorded in a

compressed proprietary format by a PVR or the like~~,~~), and either transforms the compressed video information into a ~~nonproprietary~~non-proprietary format and stores the compressed video information in the memory, or stores the video information in a compressed proprietary format in memory, and upon playback, decrypts and decompresses the data ~~in real-time~~ prior to reproducing the audio and video data for viewing.

Preferably, the media decoder is a special function processor which is capable of decrypting the received data into a non-proprietary video format in real-time, on-the-fly or otherwise. The decoder, responsive to instructions received from the player's user input device, retrieves and decompresses the compressed video information, and passes the retrieved and decompressed data to the display.

The portable digital video player is provided with at least one of a speaker and a headphone jack for reproducing an audio portion of the video information received from the media decoder of the device.

In a further aspect of the invention, the portable, digital, video player is provided as a component of a system that also includes a cradle. The cradle has a compressed video data input port, a compressed output data input port, an analog ~~audiovisual~~audio-visual input port and an encoder. An input of the encoder is coupled to the analog ~~audio visual~~audio-visual input port and produces a compressed video data signal responsive to receiving analog visual data. An output of the encoder is coupled to the compressed video data output port. The compressed video data input port of the portable player is connected to the compressed video data output port of the cradle when the portable player is docked in the cradle. Conveniently, the cradle also supplies DC power, and may have ~~a further~~ additional storage ~~medium~~ media incorporated into it to store ~~further~~ compressed video data~~, and~~. The cradle may also have a decoder which is coupled to its compressed video data input port for receiving compressed video data~~,~~. The ~~the~~ decoder ~~decompressing~~ decompresses the received compressed video data signal into an analog ~~audio visual~~audio-visual signal. Preferably an output of the decoder is coupled to the analog ~~audiovisual~~audio-visual output port of the cradle to transmit a decoded analog ~~audiovisual~~audio-visual signal to, e. g., a monitor or other display device.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will be best understood by reference to the following Detailed Description in conjunction with the drawings, in which like characters identify like parts and in which:

FIGURE 1 is a schematic diagram of a ~~low-cost~~low-cost, portable, video playback device according to the present invention;

FIGURE 2 is a more detailed block diagram of a media decoder **((104)** of FIGURE 1) incorporated into a preferred embodiment of the invention;

FIGURE 3 is a diagram showing steps in decrypting one conventional type of proprietary, compressed, digital video file;

FIGURES 4A and 4B are flow diagrams showing processes for transforming compressed video data;

FIGURE 5 is an ~~isometric view~~illustration of a portable player according a "notebook" embodiment of the invention;

FIGURE 6 is a schematic diagram showing how the portable player of the present invention permits both ~~time-shifting~~"time-shifting" and ~~place-shifting~~"place-shifting" of a broadcast video data file, illustrated with a cradle **(120)** for communicating with the portable player **(100)**;

~~FIG. 7~~FIGURE 7 is an ~~isometric view~~illustration of a "slate" embodiment of a portable player according to the invention;

FIGURE 8 is a ~~high-level~~ schematic electrical diagram of a cradle used with the portable player of the invention;

FIGURE 9 is an ~~isometric view~~ illustration of one embodiment for a cradle used in conjunction with a "notebook" embodiment of a portable player according to the invention;

FIGURE 10 is a ~~schematic sectional~~ cross-section diagram ~~detail~~ of the cradle shown in FIGURE 9, shown with a display panel of an installed player shown in an open position;

FIGURE 11 is an ~~isometric view~~illustration of a cradle into which the "slate" portable player of FIGURE 8 may be docked; and

FIGURE 12 is a cross-section diagram~~sectional detail~~ of the cradle shown in FIGURE 11.

DETAILED DESCRIPTION OF ILLUSTRATED EMBODIMENT

FIGURE 1 is a schematic diagram of the ~~low-cost~~low-cost, portable, video playback device **(100)** according to a first embodiment of the present invention~~, generally designated 100~~.

The portable video playback device **(100)** includes: a storage medium **(102)**, a media decoder **(104)**, a display screen **(106)**, at least one speaker **(108)**, and a power supply **(110)**. The storage medium **(102)** should have a storage capacity of at least twenty gigabits of data and be able to write and read data at a rate of at least 1.2Mb/second. It must also recognize an input data format over a communications channel ~~such as~~, e.g., IEEE 1394 or Ethernet. For example, storage medium **(102)** can be a Quantum 1394 hard drive of a 20G ~~or~~, 30G or greater size.

Storage medium **(102)** preferably incorporates an output shift register with a serial output. It accepts read/write commands, with addresses, from a media decoder **(104)** to select disk space for reading or writing.

The media decoder **(104)** preferably is a special purpose processor used to decode and decompress compressed video data in ~~real~~ real-time, on-the-fly or otherwise. According to one embodiment, the media decoder **(104)** performs a preliminary step of decrypting the data prior to storing the data in compressed form on the storage medium **(102)**. Alternatively, the storage medium **(102)** stores the data in the format recorded by a PVR **(116)**, and the media decoder **(104)** decrypts and decompresses the data in real time, ~~(~~on-the-fly~~)~~ or otherwise prior to the output of ~~same~~ the data to a display and an audio output.

FIGURE 2 is a ~~detailed~~ block diagram showing the minimal functional requirements of a media decoder **(104)** capable of carrying out the invention. The media decoder **(104)** preferably is built around a reduced instruction set chip (RISC) CPU **(300)** that is preferably programmed with a ~~real time~~real-time operating system (RTOS). CPU **(300)** should be able to process at least 33 million instructions per second (MIP/S). In the illustrated embodiment, the CPU **(300)** communicates with an IEEE 1394 ~~firewire~~ Firewire circuit or physical layer **(302)** and an analog audio/video interface circuit **(304)**. Alternatively, the IEEE 1394 interface circuit **(302)** may be replaced by an Ethernet interface circuit, or both of these kinds of data port interfaces or even other interfaces could be present in order to give the user flexibility in choice of data input. A small cache memory **(306)** ~~(such as 16K)~~ is used to hold that portion of the compressed data stream that is presently being processed by ~~decoder~~ CPU **(300)**. The media ~~processor~~decoder

(104) also needs an address memory **(308)**. Communication to the graphical user interface, display and audio output is made through a serial input/output controller **(309)**.

~~According to~~In a preferred embodiment, ~~a C-Cube™ DoMiNo™~~ a network media processor (e.g., a C-Cube DoMiNo or other commercially available network media processors) is used for the media decoder **(104)**. ~~This decoder~~ In the illustrated embodiment, the C-Cube DoMiNo decoder **(104)** is optimized for decoding MPEG-2 data. ~~The DoMiNo™ n~~Network media processors exist (e.g., a DoMiNo) which ~~has~~ have far more ~~capability~~ capabilities than ~~is~~ are actually needed to perform the functions minimally necessary for carrying out the invention, but ~~it is~~they are self-contained and relatively inexpensive.

Returning to FIGURE 1, and according to a preferred embodiment, the display **(106)** is a ~~touch~~ touch-screen which serves both as an input device and a display screen~~; h~~. However, a separate, dedicated input device **(106a)** ~~such as~~, e.g., a ~~touch~~ touch-pad or mouse may be added. The display **(106)** may incorporate an ion emission plate, plasma screen or other flat panel technology. Preferably, the display **(106)** has a low rate of power consumption, and is lightweight and robust. Particularly preferred for display **(106)** is an ion emission plate; these display devices exhibit excellent visual characteristics (they can be viewed from widely different angles) and have relatively low power consumption. Display **(106)** should be at least 8" x 5" and more preferably is 10" x 8" in size. In one embodiment, display **(106)** is sized to receive typical movie formats.

The display **(106)** minimally should be able to reconstruct at least television-quality imaging. It should have a refresh rate of 60 frames/second or greater. Display **(106)** can be, ~~for example~~e.g., 640 x 480 pixels, 720 x 486 pixels, or 1920 x 1080 pixels.

The speaker **(108)** may be any conventional low-power speaker such as is known in the art. The speaker **(108)** may be replaced by a headphone jack **(108a)**. Alternatively, both a speaker **(108)** and a headphone jack **(108a)** may be provided.

The power supply **(110)** may be a conventional battery. Preferably, the battery **(110)** has a rechargeable chemistry such as a lithium ion, NiCad or nickel metal halide and has sufficient voltage and capacity (~~such as~~ e.g., 50 watt-hours) to power the components of player **(100)** for a length of time that is on the same order of magnitude as the length of play of the video data which can be recorded on storage medium **(102)**.

Preferably, the power and most input and output communications of the player **(100)** are routed through a cradle **(120)**, which will be described in further detail below.

The portable video playback device **(100)** is adapted to receive compressed video data from a conventional PVR **(116)**, a personal computer **(117)**, over a local area network (~~such as~~ e.g., Ethernet) **(204)**, over a wide area network which may consist of or include the Internet, or from wireless sources by way of an antenna and an RF receiver (not shown). In operation, the portable video playback device **(100)** receives compressed data, which is stored (either in encrypted or decrypted format) on the storage medium **(102)**. The media decoder **(104)**, upon receiving appropriate commands from input device **(106)**, selects all or a portion of the compressed video data stored on disk **(102)** for retrieval, decompresses this video data, and passes the decompressed data streams on to the display **(106)** and audio outputs **(108~~/~~, 108a)**.

The PVR **(116)** stores its compressed video files in a proprietary format, which must be converted at some stage by the portable video playback device **(100)**. Video data may be transmitted from the PVR in packets with embedded ~~MPEG~~ MPEG-2 data.

The PVR **(116)** may modify a public compression standard such as MPEG-2 by providing a header on each file, by encrypting the file by a known hash algorithm, or both. According to the invention, whatever modifications the PVR makes to the standard compressed video format, the portable player **(100)** removes. As noted previously, the personal media player **(100)** may store compressed data in the storage medium **(102)** using the proprietary PVR format, or may decrypt the data and store decrypted, compressed data in the memory **(102)**.

The decoding algorithms employed by decoder **(104)** of FIGURE 2 are matched to the proprietary video format made available by the PVR **(116)**. The compressed data may be stored on the storage media **(102)** in a variety of formats ~~such as~~, e.g., MPEG-1, MPEG-2, MPEG-4, MPEG-7 or AVI, as are known in the art. While it is preferred that the compressed data be converted from the proprietary and/or encrypted PVR format prior to being stored on the storage medium **(102)**, this conversion could be performed upon retrieval from the storage medium **(102)**.

FIGURE 4A illustrates a representative process for decrypting a compressed video data file out of a proprietary format into a standard compressed video format ~~such as~~, e.g., MPEG-2. One such proprietary format is shown at **(700)** in FIGURE 3. This data file **(700)** has a header ~~of~~

(702) and a compressed video content portion **(704)**. At predetermined positions within the header **(702)** are a start address byte S and a length byte L.

At **step 301** in FIGURE 4A, the portable video player receives and recognizes a compressed data file ~~such as a~~, e.g., file **(700)** in FIGURE 3. A beginning portion of file **(700)** is stored in a buffer while file **(700)** is being decrypted. At **step 340** a file header structure, which can be stored in a ~~nonvolatile~~non-volatile memory component ~~(not shown)~~, e.g., memory **(308)** of ~~of decoder 104~~FIGURE 2, is retrieved by ~~the~~ a decoder ~~300~~, e.g., **(104)** of FIGURE 1 and FIGURE 2. The file header structure is used at **step 342** to determine where a start address byte S and a length byte L are positioned in the header **(702)** of FIGURE 3. The decoder **(104)** then reads the start address byte S and the length byte L from these locations.

~~Knowing~~ In FIGURE 4A, the start address byte S gives decoder **(104)** and offset, as measured from the beginning of the file **(700)**, to where the compressed video content begins at start address position ST of FIGURE 3. The length byte L is used to determine the length of the compressed video content. Now knowing the start address and length, at **step 344** the processor or decoder **(104)** starts copying the video content portion **(704)** of file **(700)** into another sequence of memory locations **(706)**. The ~~processor~~ decoder **(104)** therefore has available to it a conventional compressed data file to copy onto storage medium **(102)** of FIGURE 1, which it does at **step 346** ~~(FIGURE 4A)~~.

FIGURE 4B is an alternative process flow diagram showing how an ~~the~~ input proprietary data file is processed according to a second embodiment of the invention. At **step 601**, a data file is received and is stored on mass storage medium **(102)** of FIGURE 1 as a media file. At **step 602**, a command is received, instructing the media decoder **(104)** of FIGURE 1 and FIGURE 2 to retrieve the media file. The media decoder **(104)** temporarily stores portions of the file in the memory cache **(306)** ~~(~~ of FIGURE 2~~)~~ as the CPU **(300)** operates on it. At **step 640** the data file is decrypted, ~~as~~ e.g., by applying a predetermined key to it in the instance that an encryption algorithm had been applied to the data file by the PVR **(116)** of FIGURE 1 prior to transmission. At **step 642**, a beginning, predetermined, proprietary header as above described is effectively stripped from the decrypted data packet by copying only the video content of it to another memory location. At ~~this point (~~**step 644**~~)~~, the data file, still in a compressed format

~~such as~~, e.g., MPEG-2 ~~or the like~~, is decompressed into analog audio and video components and is ready to be streamed to the display **(106)** and to the audio output (122) of FIGURE 1.

The embodiment illustrated in FIGURE 4A presupposes that the proprietary format transmitted by the PVR (116) of FIGURE 1 will not be encrypted ~~as~~, e.g., by a hash algorithm, but will be associated with a proprietary header~~.~~.

The process outlined in FIGURE 4B assumes both decryption by a key and removing a header. It is also possible to provide a system in which only hashing and keyed decryption occurs. ~~Dehashing~~ Decrypting and header stripping can occur entirely or partly before or after storage on storage medium (102) of FIGURE 1.

To contain cost and minimize complexity it is preferred, for a low-cost embodiment, that the portable video playback device **(100)** be strictly a playback device, which would not provide recording capability other than that necessary for receiving the proprietary input data stream. Accordingly, functions of the media decoder **(104)**, in this embodiment, are optimized for transforming and decompressing data. In ~~less preferred~~ other, embodiments the player **(100)** could have broader read/write capabilities.

FIGURE 5 shows ~~a first~~ an exemplary representative physical embodiment **(100a)** of a portable media player. The ~~first~~ illustrated embodiment **(100a)** takes a "notebook" or "laptop" form in which a screen panel **(400)** is hinged to a lower panel **(402)** via a hinge **(404)**. While the player **(100a)** looks like a laptop computer, it is lighter, consumes less power, and is far less expensive than laptops now made, because the required logic, electronics and peripheral devices are much simpler. Further, laptop personal computers now made are not standard-equipped to decrypt proprietary PVR video formats. The "laptop" embodiment **(100a)** is advantageous because it provides a method for the user to protect the screen **(106)** when not in use by folding it down onto, and securing it to, the lower panel **(402)**.

Lower panel **(402)** includes the storage medium, e.g., storage medium (102) of FIGURE 1, ~~(not shown in this figure), the~~ a speaker **(108)**, and a touchpad **(106a)**. In the illustrated embodiment, PLAY, DEL and LOAD keys are shown in the lower panel **(402)**. These functions could alternatively be implemented in areas of the ~~touch~~ touch-screen **(106)**. ~~Panel~~ The lower panel **(402)** also includes ~~the~~ a headphone jack **(108a)** and ~~the~~ a IEEE 1394 firewire or other

~~compressed video data~~ port **(320)** for loading the video data that is to be desired to be played later.

In FIGURE 5, an introductory screen is illustrated showing the titles of the various video clips which have been loaded onto the storage medium. Scroll arrows **(406)** and **(408)** may be touched by the user to scroll through the entire content of the storage medium. One of the titles will be highlighted, as is shown at **position 410**. Pressing the DEL key will delete this title, thus freeing up the storage space devoted to it. Pressing the PLAY key will begin the playback of this clip.

In a loading sequence, onboard logic contained within player **(100a)** inspects which clips have been stored on ~~the~~ a PVR ~~(not shown)~~ (or other external system), e.g., PVR **(116)** of FIGURE 1, and permits the user to select which of these should be copied onto the storage medium of the portable player. In a load mode, the screen **(106)** shows possible titles which are available for loading from the PVR. A selection as by highlighting of one of these and pressing the LOAD key causes this compressed video clip to be loaded. Appropriate software monitors available storage space on the storage medium **(102)** of FIGURE 1, and reports if the size of the video clip ~~that is desired to be loaded~~ selected for loading exceeds available space in the player.

In FIGURE 7, ~~I~~in place of ~~the~~ a single speaker ~~108 shown~~, stereo speakers **(762)** could be provided with maximum spatial separation between them. ~~Such an embodiment is shown in FIGURE 7.~~ The "slate" portable player embodiment~~, indicated generally at~~ **(750)** has a flat panel display **(752~~,~~)**; preferably, a low-power-usage display, e.g., an ion emission plate. The dimensions of display **(752)** can be approximately 8 x 10 inches, or slightly smaller than this, so that the entire dimensions of the slate embodiment **(750)** are 8½ x 11 inches. Alternatively, the display (752) can have ~~proportionate~~ dimensions proportionate to ~~which~~ matching typical analog video movie formats, ~~such as~~ e.g., 3:4, to fit a 1200 pixel high by 1600 pixel wide format.

In this illustrated embodiment, the display **(752)** is also a ~~touch~~ touch-screen, and all of the functionality associated with the portable player **(750)** is controlled by pressing various portions of the display **(752)**. A power button **(756)** can be placed ~~On~~ on a side ~~754~~ of the portable player **(750)** ~~a power button 756 can be placed~~. The portable player **(750)** ~~side 754~~ can also have an audio headphone jack **(758)** for headphones. These controls and data ports are preferably placed near an upper end of the player **(750)**, as shown. A portion of the front surface

(760) can be occupied by separated speakers (762). A multiple pin connector (764) may be built into ~~a bottom~~ surface ~~766~~ of the case (768). For stability while disposed in a cradle (described below), it is preferred that the heavier electronic components of the portable player (750) occupy the lower two thirds of the volume of the case (768)~~, closer toward bottom surface 766~~.

Both the "laptop" and "slate" embodiments of the portable players according to the invention are designed to be used with a respective type of cradle (120), ~~schematically~~ illustrated in FIGURE 8 and FIGURE 6. The cradle (120) provides a base designed to physically receive~~for~~ the portable players (100 and 100a) ~~and is designed to physically receive it~~, as will be described below.

~~The~~ In FIGURE 8, the cradle (120) provides a permanent connection to external power and data communications. Compressed video data, as from a personal video recorder, is received on a compressed video data port (122). Analog ~~audio visual~~audio-visual signals can be received at an analog ~~audiovisual~~audio-visual signal data port (124), which includes two audio channels and one video channel. The analog ~~audiovisual~~audio-visual signals are input to an encoder (126), one output of which is connected to a multiplexer (128) and to a ~~further~~ mass storage medium (130), ~~such as~~ e.g., a hard disk or other read/write memory device with a large capacity. Multiplexer (128) has an output which is connected to a first input of a multiplexer/demultiplexer (132). An output (134) of multiplexer/demultiplexer (132) is connected to ~~the compressed video~~ a data input port of ~~the~~ a portable player (100 or 100a).

~~A second~~An input of the ~~multiplexer~~multiplexer/demultiplexer (132) is connected to an output of the storage medium (130). A second output of the multiplexer/demultiplexer~~circuit~~ (132) is connected to a decoder (136), which is operable to decode a compressed video data signal into analog ~~audiovisual~~audio-visual signal format. An input (138) of a multiplexer (140) is connected to an analog ~~audiovisual~~audio-visual output port of ~~the~~ a portable player (100 or 100a). One input of the multiplexer (140) is connected to the decoder (136). An output of the multiplexer (140) is connected to an analog ~~audiovisual~~audio-visual output port (142) of the cradle. This output port may be connected to conventional display and audio devices. A processor (144) controls the operation of encoder (126), storage medium (130), multiplexer (128), multiplexer/demultiplexer (132), and multiplexer (140). A power input port (146)

transforms and rectifies AC power and serves as a power supply for the cradle electronics as well as a recharging power source for a battery, e.g., battery **(110)** ~~(Fig. 1)~~of FIGURE 1.

~~Figure~~ FIGURES 9 and 10 show an exemplary physical embodiment of a cradle **(120a)** which is meant to receive a "laptop" personal video player **(100a)**. In this embodiment, a lower panel **(402)** of the portable video player **(100a)** rests on a horizontal, flat receiving face **(420)** of cradle **(120a)**. ~~A~~ The depth of face **(420)** is ~~intentionally less than that of panel 402~~allowed so that a user may grasp the protruding portable video player **(100a)**~~ends of panels 400 and 402~~ for ease in extraction. Left and right walls or arms **(422)** and **(424)** have respective chamfered interior sidewalls **(426~~,~~ and 428)** for ease in ~~insertably~~ guiding the player **(100a)** toward a rear player connection panel **(430)** of FIGURE 10 for insertion, into which a multiple-pin electrical connector **(432)** is mounted. ~~This~~ The connector **(432)** receives respective pins of a rear connector **(434)** of player **(100a)**.

~~The~~ In the illustrated embodiment of FIGURE 10, the user may ~~wish to~~ view player **(100a)** while it is docked in cradle **(120a)**, and for this reason the cradle **(120a)** has a recess **(436)** and a sloped surface **(438)** to permit the opening and support of panel **(400)** of player **(100a)** in and to an open position. Base **(440)** of the cradle **(120a)** is made thick enough to house a storage medium **(130)**. A rear electrical connector **(442)** is used to connect the cradle **(120a)** to AC power, at least one ~~compressed video~~ data source, and optionally, one or more video playing devices with analog audio and video lines.

FIGURES 11 and 12 show an exemplary physical embodiment of a cradle **(120b)** which is meant to receive a "slate" style personal video player **(750)**.~~A second physical embodiment 120b of the cradle is shown in Figures 11 and 12.~~ A "slate" video player **(750)** is inserted into a receptacle formed by a back upstanding wall **(800)** of FIGURE 12, left and right side panels **(802~~,~~ and 804)** ~~left and right~~with respective front flanges **(806~~,~~ and 808)**, and a bottom receiving surface **(810)** into which a multiple-pin electrical connector **(812)** is mounted. This receptacle props up the portable player **(750)** to a viewable position. The top margins of left and right side panels **(802 and 804)** and respective front flanges **(806 and 808)**~~walls 802, 804, 806, 808~~ are curved or sloped to ease the ~~slidable~~ sliding ~~registration~~ of the player **(750)** for registration into the receptacle. Walls **(800)**, left and right side panels **(802 and 804)** and respective front flanges **(806 and 808)**~~808~~ are preferably more than half, but less than all, of the height of the player

(750), so that the player (750) may stably reside in the cradle (120b) ~~but~~ and may be easily removed from it. The flanges (806, and 808) must not be so wide that the area of the screen (752) is occluded.

A base (814) of the cradle (120b) provides space for a disk or other mass storage medium (130). As in cradle (120a), a multiple-pin electrical connector (442) is mounted to a rear panel (816) to provide connector to AC power, at least one source of ~~compressed video~~ data, ~~in a predetermined format,~~ and possibly other remote devices.

FIGURE 6 is a schematic diagram showing how the invention permits both ~~time-shifting~~"time-shifting" and "place-shifting" of a broadcast video data file. The personal video recorder (116) can receive television signals or other video signals from such sources as direct UHF or VHF through antenna (500), a satellite dish (502) or a cable (504). An on-board receiver in the personal video recorder (116) can be used to pick up these signals, or alternatively a receiver module of an associated television set (506) may be used to pick up the video signals. The PVR (116) has the capability of ~~time-shifting~~"time-shifting" and compressing these video data signals to permit the user to play them back at a time other than their initial broadcast.

~~According to~~In one embodiment of the present invention, the PVR (116) has a ~~compressed video~~ data output port, ~~such as an~~e.g., an IEEE 1394 firewire output port (508), which the user may connect to the input port of cradle (120). The player (100) is initially docked in cradle (120). The user can then download selected tracks or data files from recorder (116) or other source (e.g., storage medium (130), or via wired or wireless receiver communications) onto the portable media player (100). The user then removes the player (100) from the cradle (120) and transports the portable media player with him or her, as shown, to play at his or her leisure at a remote location. This permits the playback of a video data file as shifted both in time and in space.

While various embodiments of the present invention have been shown and described, it should be understood that other modifications, substitutions and alternatives can be made without departing from the spirit and scope of the invention, which should be determined from the appended claims.